

MEETING SUMMARY

Generating hypotheses for MSE operating models and FATE Hake project

MSE Working Group Call #2

May 22, 2018 10-11:30a

Attending the call: Kristin Marshall (NWFSC), Mike Malick (NWFSC), Nis Jacobsen (NWFSC), Andy Edwards (JTC), Aaron Berger(JTC), Frank Lockhart (JMC), Bruce Turris (JMC), Paul Ryall (JMC), Dan Waldeck (JMC), Mike Buston (AP), Mike Okoniewski (AP), Shannon Mann (AP), Joe Bersch (AP), Michelle McClure (SRG)

Objectives for the call:

- Get input from the MSEWG on their views on potential hypotheses about what influences the distribution of hake within and among years to inform the FATE Hake project
- Share progress on MSE operating model development to date
- Get input from the MSEWG on initial operating model structure/assumptions and generate ideas about alternative operating model structures the MSEWG would like MSE analysts to consider

Note: discussion questions are bullets in each section, with italicized sub-bullets representing observations shared by MSEWG members on the call

Part One: Mike Malick gave an overview of the FATE Hake project and his progress on developing models of Pacific hake distribution. He prompted discussion using the following questions:

- What factors influence where hake are located within a year?
 - *feed (shrimp, krill, and YOY hake)*
 - *water temperature*
 - *water clarity*
 - *prevailing winds*
 - *predation*
 - *correlation between freshwater outflow of the columbia*
 - *seasonal east-west movement patterns in Canada*
- What causes changes in hake spatial distribution across years?
 - *Observations of a dramatic shift (reduction) in hake biomass and larger/older size classes in Canadian waters, comparing the 1980s and 1990s to the period from 2000 to present*
 - *Northward shift in fishing grounds in Canada since 2000*
 - *Potential drivers of hake distribution that were mentioned: prey availability, temperature, fishing*
- Why are hake distributed further north in some years?

- *Observations of appearance of 2006 and 2008 year classes in Canada, but were perceived as less abundant as ages 3 and 4 in US waters. This may suggest migration patterns could be more complicated than a north-south pattern*
- Other important factors that emerged in the discussion:
 - *Importance of distinguishing between the distribution of fish and the distribution of accessible fish (external factors like market drivers may influence where, when, and how much fish are caught)*
 - *Importance of external drivers (having a port/plant available to deliver to)*
 - *Increase in length of the fishing season since the 1980s, particularly in Canada-- caused by technological changes, shifts in processing, and where the fish are occurring. US side has been more static in processing.*
 - *Increasing depth of fishing*

Part Two: Nis Jacobsen gave an overview of progress on the operating model for the MSE, and current assumptions of the model. He prompted discussion with the following questions:

- What assumptions in the preliminary operating model do you think are the most constraining or incorrect? What alternative OM configurations we should consider (e.g., higher spatial complexity, spatial selectivity)?
 - *Performance metrics should be calculated over shorter and longer time scales (e.g. 10 years and 30-50 years)*
 - *Movement parameters (transition matrix) is fixed across years for now, but this could be flexible*
 - *Movement increases with age based on assumption that swimming distance scales with size*
 - *Consider including some resident fish that don't move between the 2 model boxes*
- How do you think catches should be implemented based on the harvest control rule? Should full allocation be applied in both countries in all years? How do you think we should capture differences in attainment of the allocation of quota among sectors or countries?
 - *Treat catch as scenarios, e.g.:*
 - *Assume total allowable catch from the HCR is removed from the population*
 - *Assume 85 percent of total allowable catch from HCR is removed (allow for 15 percent carryover the following year)*
 - *Assume some lower percentage based on historical decisions*
 - *Consider exploring management strategies that focus more strongly on particular age classes (e.g., harvest only 1 year olds or harvest only 4 years olds)*
- Do you think seasonality in catches makes a difference in the potential impacts of fishing on the population dynamics?

- *In Canada, slower fishing at the beginning and end of the season, peaks in summer, and age proportions in the catch can also change by season*
- *Fish condition also changes with season- they fatten up during the summer*
- Do you think there are significant differences in fishing gear used in the U.S. and Canada that the operating model should try to represent, or are differences in ages observed in the catch only due to which fish are available in the two countries?
 - *Observations of interactions between gear selectivity, availability of fish, and fisher behavioral choices. E.g.,*
 - *In Canada, infrequent age 1 and 2 because they aren't there, mostly movement and not selectivity*
 - *In Canada, age 2 fish are avoided and they don't see many*
 - *In US, small fish are not desirable, but they can be used if they're caught. Equal effort to avoid them. Prevalence is greater in the US and sometimes mixed in with 3 year old fish*